

ORIGINAL ARTICLE

A 5 year retrospective study of biopsied jaw lesions with the assessment of concordance between clinical and histopathological diagnoses

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Received: 24-04-2015

Accepted: 09-03-2016

ABSTRACT

Introduction: The jaw can be affected by several lesions that manifest in the oral cavity, but little is known about their distribution patterns in various populations. **Aims and Objectives:** This study presents the frequency and distribution of biopsied jaw lesions recorded in Faculty of Dentistry and gathers the information including provisional and final diagnosis of the lesions. **Material and Methods:** Biopsy of 1938 lesions (2008–2013) was reviewed and 1473 lesions were included in this study. The provisional diagnosis and histopathological validations of lesions were compared. Data on the location of the lesion, as well as patient demographics, were also evaluated. The lesions were divided into three major groups as 1 - developmental/reactive and inflammatory lesions of the jaw, 2 - cystic lesion and 3 - tumor and tumor-like lesions. **Statistical Analysis:** The variables were recorded and analysed using descriptive statistics. **Results and Observations:** Three hundred and ninety-six lesions were in Group 1 and periapical granuloma was the most frequent diagnosis. Seven hundred and eighty-nine lesions were in Group 2 and the radicular cyst was the most frequent diagnosis. Two hundred and eighty-eight lesions were in Group 3 and the keratocystic odontogenic tumor was the most frequent. Two hundred and ninety-one biopsied lesions were in disagreement with respect to the diagnoses on clinical and histopathological examination. **Conclusion:** Consequently, a provisional diagnosis of some of the malignant lesions was reactive, inflammatory, cystic or benign lesions, therefore the importance of evaluation of the specimen is emphasized.

Key words: Clinical provisional diagnosis, demographic study, jaw lesions

INTRODUCTION

The jaw lesions, ranging from inflammatory processes to malignant neoplasms, can be seen in all ages with or without any symptoms. The clinical signs and symptoms of these lesions differ by type, but some lesions, although benign, can resorb roots, move teeth, have a high recurrence rate and cause pain or paresthesia; thus, it is important to correctly diagnose for proper treatment.^[1] The diagnosis of jaw lesions is established from the different clinical and radiological features though the final diagnosis is based on histopathological examination

of the lesion.^[2,3] In addition, reports of carcinoma arising from the cystic wall highlight the need for biopsies of these lesions.^[4] Hence, the initial clinical diagnosis must be accurate and should not miss any premalignant or malignant pathologic features.

Because of the diversity of lesions that can arise from the odontogenic tissues, several classification schemes have been

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How to cite this article: Peker E, Öğütlü F, Karaca İR, Gültekin ES, Çakır M. A 5 year retrospective study of biopsied jaw lesions with the assessment of concordance between clinical and histopathological diagnoses. J Oral Maxillofac Pathol 2016;20:78-85.

Access this article online

Quick Response Code:



Website:
www.jomfp.in

DOI:
10.4103/0973-029X.180945

published to define their diagnostic criteria and biological behavior. At present, most of the investigations cite the World Health Organization's histological typing of odontogenic tumors, updated in 2005, when reporting isolated cases or series of these conditions.^[5]

The aim of this study was to determine the frequency of all biopsied jaw lesions and gather the information including clinical diagnoses and final diagnoses of the lesions to compare them for an accuracy level of clinical diagnoses and to emphasize the importance of routine biopsy.

MATERIALS AND METHODS

This retrospective study was performed at the Faculty of Dentistry, Gazi University. The data were collected from the archives of the Department of Oral and Maxillofacial Surgery and the Department of Oral Pathology. Ethical clearance was obtained from the Ethics Committee at Gazi University. The patient records from 2008 to 2013 were reviewed considering gender, age, location of lesion, provisional and final histopathological diagnoses. The biopsy referral forms generated from the Department of Oral and Maxillofacial Surgery and their corresponding histopathologic reports from the Department of Oral Pathology were compared to assess the concordance between initial clinical provisional diagnoses and histopathologic final diagnoses of all jaw lesions. Lesions were divided into three major categories based on their final histopathologic diagnoses: Group 1: Developmental/inflammatory/reactive lesions of the jaw, Group 2: Cystic lesions and Group 3: Tumors and tumor-like lesions.

RESULTS

A total of 1938 patient records were reviewed. About 251 lesions with missing data and 214 soft tissue lesions were excluded from the study and the resulting 1473 records were included in the study. The distribution of lesions between groups were group 1: 396 (26.9%), Group 2: 789 (53.6%) and Group 3: 288 (19.5%) [Figure 1]. As for gender, 795 cases were of males (54.0%) and 678 cases were of females (46.0%). The overall male to female ratio was 1:1.7. About 734 lesions were diagnosed in the maxilla (49.8%) and 739 lesions were in the mandible (50.2%). The overall mandible to maxilla ratio was 1:1. The patients' age ranged from 5 to 86 years and the mean age was 40 ± 1.9 years [Table 1].

Overall, radicular cysts ($n = 440$; 29.9%) were the most common biopsied jaw lesion, followed by periapical granuloma ($n = 337$; 22.9%), dentigerous cysts ($n = 247$; 16.8%), keratocystic odontogenic tumors (KCOTs) ($n = 107$; 7.3%) and residual cysts ($n = 76$; 5.2%).

Table 2 shows the distribution of the 396 developmental/inflammatory/reactive lesions of the jaw in Group 1. Periapical granulomas constitute more than 75 percent of this group

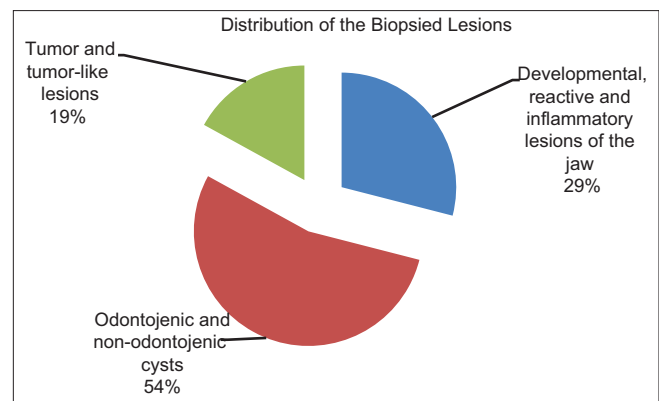


Figure 1: Distribution of types of jaw biopsies ($n = 1473$). 'Cysts' do not include keratocystic odontogenic tumor and calcifying cystic odontogenic tumors; 'tumors and tumor-like lesions' include keratocystic odontogenic tumors and calcifying cystic odontogenic tumors

($n = 337$, 85.1%) and the mean age was 38 years. There were 37 (9.3%) hyperplastic dental follicle cases with the mean age of 28 years. Osteonecrosis, osteomyelitis and torus/exostosis were also seen in this group [Table 2]. The anterior maxilla and molar region of the mandible were shown to be most common sites for the Group 1 lesions, with an occurrence rate of 47.7% and 24.8%, respectively. The occurrence of this group of lesion was seen a little more frequently in women (58.3%). According to the statistical analysis, the incidence of Group 1 lesions was not associated with gender ($P > 0.05$). The frequency of group 1 lesions was significantly different between different localizations in the lower jaw ($P < 0.05$). The most frequent localization was a molar region in the lower jaw. The frequency of Group 1 lesions was significantly different between different localizations in the upper jaw ($P > 0.05$). The prevalence of the Group 1 lesions was more frequent in maxilla ($P < 0.001$).

Within Group 2 lesions, radicular cysts were the most prevalent cyst ($n = 440$, 55.8%), followed by dentigerous cysts ($n = 247$, 31.3%) and residual cysts ($n = 76$, 9.6%) and their mean ages were 41.40 and 49 years, respectively. Other cysts, which were found in smaller numbers, included incisive canal cyst, mucous retention cyst, lateral periodontal cyst and traumatic bone cyst. This group of lesions were almost equally present in maxillary anterior and mandible molar regions ($n = 294$, 37.3% vs. $n = 251$, 31.8%). A greater incidence in males than females was also reported in this group ($n = 494$, 62.6% vs. $n = 295$, 37.4%) [Table 3]. The incidence of Group II lesions was associated with gender ($P < 0.05$). Group 2 lesions were more frequent in males ($P = 0.007$). The frequency of group 2 lesions was significantly different between different localizations in the lower jaw ($P < 0.05$). The most frequent localization was a molar region of the lower jaw ($P = 0.000$). The frequency of Group 2 lesions was significantly different between different localizations in the upper jaw ($P < 0.05$). The most frequent localization was an anterior region of the upper jaw ($P = 0.000$). The frequency of Group 2 lesions

Table 1: Frequency of biopsied lesions and their distribution according to location, gender, and age

Diagnostic Group	n (%)		Location				Gender				M: F ratio	Age range (year)	Mean age±SD, years
			Maxilla		Mandible		Male		Female				
			n (%)	n (%)	n (%)	n (%)	n (%)	n (%)					
Developmental, reactive and inflammatory lesions of the jaw (Group I)	396	26.9	232	58.6	164	41.4	173	43.7	223	56.3	1:1.3	5-86	38±5.9
Cystic lesions (Group II)	789	53.6	400	50.7	389	49.3	494	62.6	295	37.4	1.7:1	9-83	42±3.3
Tumor and tumor-like lesions (Group III)	288	19.5	90	34.6	170	65.4	124	47.7	136	52.3	1:1,1	7-76	38±6.5
Total	1473	100	734	49.8	739	50.2	795	54.0	678	46.0			40±1.8

Table 2: Frequency of group I lesions and their distribution according to location, patient's gender and age

Diagnostic Group I	n %		Location									Gender				Mean age±SD, years			
			Maxilla						Mandible			Male		Female					
			Anterior		Premolar		Molar		Anterior		Premolar	Molar	Male		Female				
			n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %				
Periapical Granuloma	337	85.1	177	44.7	16	4.0	22	5.6	37	9.3	20	5.0	65	16.4	146	36.9	191	48.2	38±13,2
Hyperplastic Dental Follicle	37	9.3	11	2.8	1	0.2	1	0.2	-	-	3	0.8	21	5.3	18	4.5	19	4.8	28±8,7
Osteonecrosis	9	2.3	-	-	-	-	1	0.2	3	0.8	2	0.6	3	0.8	5	1.3	4	1.0	62±17,1
Osteomyelitis	7	1.8	-	-	-	-	-	-	1	0.2	-	-	6	1.5	1	0.2	6	1.5	53±12,5
Torus/Exostosis	6	1.5	1	0.2	-	-	2	0,6	-	-	-	-	3	0.8	3	0.8	3	0.8	53±6,7
Total	396	100	189	47.7	17	4.2	26	6.6	41	10.3	25	6.4	98	24.8	173	43.7	223	58.3	

Table 3: Frequency of group II lesions and their distribution according to location, patient's gender and age

Diagnostic Group II	n %		Location											Gender				Mean age±SD, years			
			Maxilla						Mandible					Male		Female					
			Anterior		Premolar		Molar		Anterior		Premolar	Molar	Ramus	Male		Female					
			n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %					
Radicular Cyst	440	55,8	213	48,4	24	5,5	27	6,1	56	12,7	35	8	73	16,6	12	2,7	265	60,2	175	39,8	41±12,9
Dentigerous Cyst	247	31,3	40	16,2	3	1,2	27	10,9	9	3,6	15	6,1	152	61,5	1	0,4	151	61,1	96	38,9	40±13,5
Residual Cyst	76	9,6	23	30,3	8	10,5	10	13,2	3	4	6	7,9	26	34,2	-	-	60	79	16	21	49±12,7
Lateral Periodontal Cyst	2	0,3	1	50	-	-	-	-	-	-	1	50	-	-	-	-	1	50	1	50	50±28,3
Incisive Canal Cyst	18	2,3	17	94,4	1	5,6	-	-	-	-	-	-	-	-	-	-	12	66,7	6	33,3	52±7,7
Mucous Retention Cyst	5	0,6	-	-	2	40	3	60	-	-	-	-	-	-	-	-	4	80	1	20	36±3,6
Traumatic Bone Cyst	1	0,1	-	-	-	-	1	100	-	-	-	-	-	-	-	-	1	100	-	-	23±0
Total	789	100	294	37,3	38	4,8	68	8,6	68	8,6	57	7,2	251	31,8	13	1,6	494	62,6	295	37,4	

is significantly different between upper and lower jaws. Radicular cysts were seen more frequently in the maxilla and dentigerous cysts were seen more frequently in the mandible ($P = 0.000$).

The third major group includes odontogenic ($n = 192$, 66.7%) and benign non-odontogenic tumors ($n = 96$, 33.3%). Odontogenic tumors comprised of KCOT ($n = 107$, 37.1%) mainly. Odontoma and ameloblastoma were the second and third common lesions among odontogenic tumors group ($n = 48$, 16.7% and $n = 21$, 7.3%, respectively). The least common lesions were periapical cemental dysplasia

($n = 5$, 1.8%), adenomatoid odontogenic tumor ($n = 5$, 1.8%), cementoblastoma ($n = 3$, 1.0%), calcifying cystic odontogenic tumor ($n = 2$, 0.7%) and odontogenic fibroma ($n = 1$, 0.3%). The most common lesion was ossifying fibroma (OF) ($n = 43$, 14.9%) followed by the central giant cell granuloma ($n = 28$, 9.7%), osteoma ($n = 21$, 7.3%) and cemento-osseous dysplasia ($n = 4$, 1.4%) in benign non-odontogenic tumors. Nearly one-third ($n = 90$, 31.2%) of tumor/tumor-like lesions were seen in the molar regions of mandible. Anterior and molar regions of maxilla were other prominent anatomical sites ($n = 57$, 19.8% and $n = 31$, 10.8%). More than half of the patients (55.2%) were in the fifth decades of life. The tumor/

tumor-like lesions were almost equally diagnosed in both genders [Table 4]. The incidence of benign non-odontogenic tumors in Group 3 lesions was not associated with gender and localization of the jaws while benign odontogenic tumors were more common in women with mandibular localization being the most common ($P < 0.05$).

The concordance of diagnoses as a result of comparison of provisional and final diagnoses was 80.5%. In Group 1 lesions, there were 168 diagnostic disagreements (58.5%). Of these, 155 cases were diagnosed provisionally as cystic lesions (54.0%), 13 cases as tumor/tumor-like lesions (4.5%). In Group 2 lesions, there were 38 diagnostic disagreements (13.2%). In 21 cases, tumor/tumor-like lesion (7.3%) and in 17 cases, developmental/inflammatory/reactive lesions were provisional diagnoses (5.9%). In Group 3 lesions, there were 85 diagnostic disagreements (29.6%). Of these, 73 cases were diagnosed provisionally as cystic lesion (25.4%), 12 cases as developmental/inflammatory/reactive lesion (4.2%) [Figure 2].

Of all these lesions, periapical granuloma was the most frequent lesion which was provisionally diagnosed as

a radicular cyst. The second most common type was KCOT, which was diagnosed as dentigerous or radicular/residual cyst provisionally. Another most common type was ameloblastoma that was diagnosed provisionally as a dentigerous cyst.

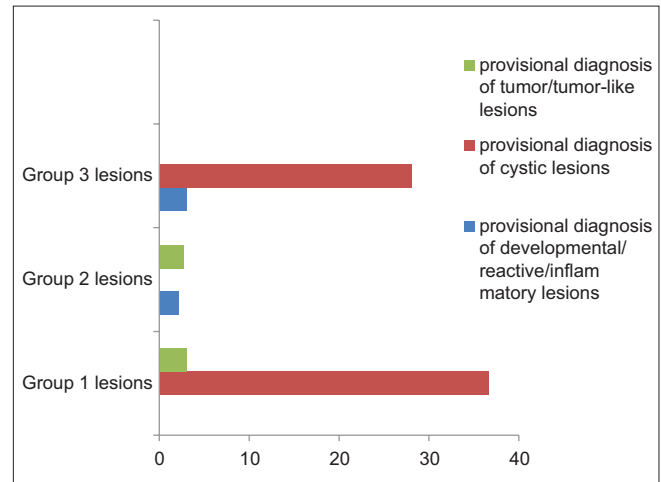


Figure 2: Distribution of the disagreements of provisional and final diagnoses in groups of all cases

Table 4: Frequency of group III lesions and their distribution according to location, patient's gender and age

Diagnostic Group III	n	%	Location														Gender		Mean age±SD, years				
			Maxilla						Mandible								Male	Female					
			Anterior		Premolar		Molar		Anterior		Premolar		Molar		Angulus					Ramus			
			n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		n	%	n	%
Odontogenic Tumors																							
Keratocystic Odontogenic Tumor	107	37.1	12	4.2	3	1.0	12	4.2	5	1.8	5	1.8	38	13.2	4	1.4	28	9.7	68	23.6	39	13.5	42±16,0
Odontoma	48	16.7	20	6.9	1	0.3	8	2.8	9	3.1	1	0.3	9	3.1	-	-	-	-	27	9.5	21	7.3	27±13,2
Ameloblastoma	21	7.3	1	0.3	-	-	-	-	4	1.4	-	-	13	4.5	-	-	3	1.0	4	1.4	17	5.9	49±16,7
Periapical Cemental Dysplasia	5	1.8	-	-	1	0.3	-	-	-	-	1	0.3	3	1.0	-	-	-	-	-	-	5	1.7	40±7,1
Adenomatoid Odontogenic Tumor	5	1.8	3	1.0	2	0.7	-	-	-	-	-	-	-	-	-	-	-	-	2	0.7	3	1.0	32±13,0
Cementoblastoma	3	1.0	-	-	-	-	1	0.3	-	-	1	0.3	1	0.3	-	-	-	-	2	0.7	1	0.3	27±11,6
Calcifying Cystic Odontogenic Tumor	2	0.7	-	-	-	-	-	-	-	-	1	0.3	1	0.3	-	-	-	-	1	0.3	1	0.3	15±7,1
Odontogenic Fibroma	1	0.3	-	-	-	-	1	0.3	-	-	-	-	-	-	-	-	-	-	1	0.3	-	-	42±0
Total	192	66.7	36	12.5	7	2.4	22	7.6	18	6.2	9	3.1	65	22.6	4	1.4	31	10.8	105	36.5	87	30.2	38±7.8
Benign nonodontogenic Tumors																							
Ossifying Fibroma	43	14.9	9	3.1	2	0.7	8	3.1	6	2.1	11	3.8	7	2.4	-	-	-	-	12	4.2	31	10.8	39±13,0
Central Giant Cell Granuloma	28	9.7	8	2.8	4	1.4	-	-	4	1.4	2	0.7	10	3.5	-	-	-	-	4	1.4	24	8.3	36±17,1
Osteoma	21	7.3	4	1.4	1	0.3	1	0.3	3	1.0	7	2.4	5	1.8	-	-	-	-	7	2.4	14	4.9	40±17,6
Cemento-osseous Dysplasia	4	1.4	-	-	-	-	-	-	-	-	-	-	3	1.0	1	0.3	-	-	-	-	4	1.4	45±5,8
Total	96	33.3	21	7.3	7	2.4	9	3.1	13	4.5	20	0.7	25	8.7	1	0.3	-	-	23	7.9	73	25.3	40±1.5
Total	288	100	57	19.8	14	4.8	31	10.8	31	10.8	29	10.1	90	31.2	5	1.7	31	10.8	128	44.4	160	55.6	38±6.5

DISCUSSION

This study demonstrated the general profile of oral lesions in Turkish population. It was difficult to compare the results with other studies as they were performed in a specific group of lesion^[6,7] or age.^[8] In our study, the majority of the lesions were in the category of odontogenic/non-odontogenic cysts and it is consistent with the findings of Al Yamani *et al.*^[9] and Utsumi *et al.*^[10] However, some studies report that developmental/inflammatory and reactive lesions were more common than cystic lesions.^[11-13] In our study, odontogenic cysts constitute 53.6% of all lesions. This was much more than what was reported in most studies, but current literature shows that odontogenic cysts account for between 0.8% to 45.9% of all lesions.^[14] This finding may be related to the profile of our sample, in which most patients were referred to our university from other clinics for surgical procedures that require expertise to do. In addition, it can be assessed as a result of differences in referral practice. For odontogenic cysts, the overall mean age (42 years) was similar to the result from Johnson *et al.*^[15] (43.4 years) and Meningaud *et al.*^[16] (41.8 years) The overall male to female ratio (1.7:1) was similar to the results of Johnson *et al.*,^[15] Meningaud *et al.*,^[16] and Sharifian *et al.*^[17] The overall maxilla: mandible ratio (1:1) was consistent with Grossman *et al.*^[18] and Sharifian *et al.*^[17] Radicular cysts (55.8%) were the most biopsied lesions followed by dentigerous cysts (31.3%) and residual cysts (9.6%) in cystic lesions and these data support the data presented by Nuñez-Urrutia *et al.*^[19] from Spain and de Souza *et al.*^[20] and Prockt *et al.*^[21] from Brazil.

Periapical granuloma (22.8% of all lesions) was the most common lesion in Group 1 lesions; this value is lower than the results of Mendez *et al.*^[13] and Koivisto *et al.*^[3] This is probably due to conservative treatment protocol of the teeth with periapical lesions or lack of submission of excised specimens by our surgeons. The frequency of hyperplastic dental follicle (2.5% of all lesions) is lower than the results of Lei *et al.*^[22] and Wang *et al.*^[8] who reported the prevalence of hyperplastic dental follicles in biopsied oral and maxillofacial lesions in pediatric patients. This determination is quite inappropriate to our study which has an adult patient profile. For Group 1 lesions, the overall male to female ratio (1:1.3) was consistent with Daley *et al.*^[23] and Eversole *et al.*^[24] and maxilla: mandible ratio (1.2:1) was different from many studies.^[13,25] These observations showed a female predominance and localization of periapical granuloma in the maxillary anterior region mostly.^[26]

The WHO classification of odontogenic keratocyst updated in 2005 and parakeratinized type is termed as KCOT. This reclassification caused changes in frequency of both odontogenic cysts and tumors.^[27] In the present study, tumor or tumor-like lesions of the jaws constituted 17.6% of all lesions. This rate is much more than what was reported in previous reports on reviewing, according to the 1992 WHO classification.^[28-30] KCOT, odontoma and ameloblastoma

were the most frequent odontogenic tumors consecutively in this study and this finding is consistent with the study done by Gaitán-Cepeda *et al.* from Mexico.^[31] The frequency of the remaining odontogenic tumor/tumor-like lesions such as periapical cemental dysplasia, adenomatoid odontogenic tumor, cementoblastoma, calcifying cystic odontogenic tumor and odontogenic fibroma, appears to be a rare occurrence. Some studies, including the present study, reported that odontogenic tumors affect females more than males.^[31-34] The age range of patients varied from 7–76 years, with a mean of 38 years, similar to data reported by Luo and Li *et al.*^[28] and Simon *et al.*^[33] Data from the present study and earlier series^[28,35,36] showed that KCOT was the most frequent odontogenic tumor, occurring mainly in the posterior mandible and in males with a definite predominance. In contrast to our data, several studies of odontogenic tumors have reported odontoma as the most prevalent odontogenic tumor.^[30,37,38] It is the second prevalent one with a slight male predilection similar to Fernandes *et al.*^[39] and the main location is anterior maxilla similar to that reported by Avelar *et al.*^[34] and Osterne *et al.*^[36] Of the odontogenic tumors, ameloblastoma ranked third with a prevalence of 8.1%, a definite female preponderance and involvement of posterior mandible. These data showed the same gender predilection as that in Chile^[40] and Mexico^[37] and location predilection as that in several studies.^[40-42] Benign non-odontogenic tumors or tumor-like lesions were less common than odontogenic tumors in this study, which is in concordance with several studies.^[15,25,43] OF, which is one of the subtypes of benign fibro-osseous lesions, was most common in benign non-odontogenic tumors. The frequency of OF (14.9%) is similar to the findings of Parkins *et al.*^[43] (11.8%) and prevalent localization in the mandible is consistent with the results of Lerda *et al.*^[44] The frequency of the central giant cell granuloma is 1.9% of all jaw lesions. These data are consistent with Ali *et al.*^[25] and Koivisto *et al.*^[3] but greater than Mendez *et al.*^[13] from Brazil. The observed osteoma prevalence is 7.3%, most commonly reported in adults and in females which is in contrast to the findings of An *et al.*^[45] and Rushton *et al.*^[46] Osteomas mostly involve mandible in this study and this finding is the same as the findings of previous reports.^[45-48] Cemento-osseous dysplasia, which affects bone metabolism replacing normal bone by cemento-osseous tissue, constituted 0.3% of all lesions, also it was seen in woman and mandible mostly. These data are consistent with Su *et al.*,^[49] Waldron,^[50] MacDonald-Jankowski^[51] and Kawai *et al.*^[52]

The study revealed that concordance between clinical and histopathological diagnoses of all lesions was 80.5%. In this study, many of the diagnostic disagreements were in the developmental/inflammatory/reactive lesions group. Periapical granuloma, which was provisionally diagnosed as a radicular cyst, constitutes the overwhelming majority of the diagnostic disagreements. These data did not surprise us because of the same pathogenic process they have.^[53] According to the International Classification of Diseases for Dentistry and Stomatology classification, which is an extensive

classification of the diseases of the digestive system based on the originated tissues, periapical granuloma and radicular cyst are in the same subcategory as “disease of the pulp and periapical tissues.” The products of pulpal infection initiate an inflammatory response and stimulate the proliferation of the rests of Malassez in the periapical granuloma and the epithelial cell mass enlargement leads to cyst formation. Most radicular cysts are small, but they can reach a large size.^[54] Hence, it was difficult to differentiate them by clinical and radiographic appearance and these data were consistent with the results of Lia *et al.*^[53] who reported a considerable degree of disagreement between the clinical, radiographic diagnoses and histological findings of these two lesions. In addition to this, differential diagnoses of periapical lesions as the lesions of non-endodontic origin should be considered because of their different treatment protocols and prognoses. Radicular cysts generally cause painful swelling but in the anterior maxilla, they can be asymptomatic because of the thin cortical bone of this anatomic site.^[55] Therefore, pulp vitality tests may help to determine the origin of the disease.

KCOTs mimicking cystic lesions were reported by several studies published in recent years.^[56-59] The current study supports these studies since there were 38 cases of KCOT, diagnosed as inflammatory cystic lesions or dentigerous cysts provisionally. Clinically, KCOT presents mostly at the posterior region of the mandible in young males as an intraosseous lesion, but it might also mimic a gingival cyst with a gingival swelling.^[60] Radiographically, KCOTs are generally unilocular with a well-defined limit and exhibits buccolingual expansion. In contrast to a radicular cyst, KCOT can indicate great growth potential and in some cases, huge dimensions have been reported.^[61] Hence, KCOTs should be included in the differential diagnoses of cystic lesions due to their aggressive behavior and recurrence in spite of complete removal.^[62] The emphasis on identifying whether the lesion is a cyst or KCOT is important for surgical procedures. Radicular and dentigerous cysts can completely be cured with simple enucleation, while a simple enucleation of KCOT can have recurrence rate of upto 27.8%.^[63]

In our study, another tumor/tumor-like lesion that was diagnosed provisionally as cystic lesion was ameloblastoma. It is recognized that the radiological appearances of cysts and tumors related to an impacted tooth are similar and there is no definitive method in the differential diagnosis.^[64] Bailey^[65] was first to report dentigerous cyst with an ameloblastoma and then cystic lesions involving ameloblastomas reported in the studies thus far.^[66-69] Although some subtypes of ameloblastoma, such as unicystic ameloblastoma, have a good prognosis and simple enucleation is the adequate treatment, all of the cystic lesions must be examined histopathologically, not to miss other subtypes such as solid or mural ameloblastoma. Moreover, there are some case reports of serious pathologies mimicking benign lesions or cysts of the jaws.^[70-73] The remaining diagnostic disagreements of our study are similar

to this reported data with the cases of lymphoma mimicking peripheral giant cell or pyogenic granuloma, squamous cell carcinoma mimicking peripheral giant cell granuloma and squamous papilloma mimicking fibroepithelial hyperplasia. This inconsistency might be due to subjective interpretation of the clinical and radiographical examination of these lesions, whereas biopsy is the definitive diagnostic tool.

Surgeons do not submit every pathological specimen that is removed by surgical procedures or tooth extractions, that mimic a dental follicle or radicular cyst or granuloma. These lesions cannot be analyzed histologically, thus some serious pathologies can be miss out.^[74]

CONCLUSION

The diagnosis of oral lesions should be based on clinical, radiographic and histopathologic features. Oral and Maxillofacial Surgeons must establish the histological diagnosis of their cases by routine biopsy and provide an adequate treatment, which might involve further procedures. This will prevent unnecessary treatments and delayed surgical operations.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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